opposite character. In the first place, the very condensation of the vapour which forms them, sets free a quantity of latent heat, which retards the fall of temperature, that would otherwise take place in every ascending current; and such currents exist in the large majority of rain clouds, if not in all; and, secondly, the solar radiation, which the cloud stratum shuts off from the earth, must be partly absorbed in the evaporation of the cloud surface.

Hence, there seems to be much probability, that the temperature anomalies of the higher strata of the atmosphere, as a general rule, are of the opposite character to those shown by our land observatories at low levels; but if so, the elevation at which this law holds good, must be considerably greater than that at which the hill observatories of the Himalaya afford the means of verifying it.

VII.—*Description of a rain-gauge with evapometer, for remote and secluded stations.* By H. F. Blanford, F. R. S., *Meteorological Reporter to the Government of India.*

(With Plate XV.)

[Received 25th March 1881. Read 6th April 1881.]

In the autumn of 1879, I received, through the Government of India, a description and sketch of a rain-gauge proposed by Mr. Hutchins, Assistant Conservator of Forests in Mysore, for the purpose of collecting the rainfall at remote and rarely visited stations, such as in certain forest tracts, and other places, where there are no permanent residents, and which can be visited only at longer or shorter intervals. There are, it is true, several forms of rain-gauge provided with mechanism for the purpose of registering the fall, but these are expensive at the outset, and if, as frequently happens, the mechanism becomes deranged, the gauge must as a rule be sent to a Presidency town or some large Government workshop for repair; involving further expense and an interruption of the record, at a time, perhaps, when it is most inconvenient.

Mr. Hutchins' idea was to provide a gauge of sufficient capacity to hold the rainfall of a month or even longer period, which might be measured on periodical visits to the station; and since, under such circumstances, there must always (except in prolonged wet weather) be an appreciable loss by evaporation, he proposed to use an evapometer with the gauge, which should show the evaporation in the intervals of the measurement; which quantity, being added to the rainfall collected and measured, would give the total fall in the interval.

The instrument proposed by Mr. Hutchins consisted of two cylindrical vessels of equal size, *viz.*, 8 inches diameter, one three times as deep as the other,* which were to be buried side by side in the ground. The deeper which was to receive the rain, was surmounted by a funnel of the usual character, also 8 inches in diameter; having a small hole at the bottom, through which the rain should run into the receiver. The other, which was to serve as an evapometer, was closed by a conical cover with a small hole at the apex; and over this was supported a second conical cover of the same diameter, leaving an interspace of about 1 inch, through which the vapour might diffuse and escape around the edges. Both were to be padlocked, to prevent any vitiation of the results, by unlicensed interference, on the part of any too curious enquirer.

Before having the instrument constructed, I slightly altered the design, by reducing the size of the outer or protecting conical cover of the evapometer, and surrounding both the receiving cylinders with a second outer cylinder, in order to protect the upper part of the receiver more effectually against direct heating by the sun. The instrument, thus modified, is represented in the accompanying figure; it was made at the Mathematical Instrument department and in March 1880 was set up at the Alipore observatory; (buried in the ground, in the immediate neighbourhood of the 5 inch Symons gauge, which serves for the daily measurement of the rainfall.

At the beginning, 4 inches of water, as measured in the measure-glass, for the 8-inch gauge, was placed in the evapometer, and an equal quantity in the receiver of the gauge, (in order to provide for evaporation in anticipation of rain). At the end of a month, the water in both cylinders was measured; and the difference taken as representing the rainfall of the period. Four inches of water was then replaced in each cylinder, and the instruments were closed and left untouched for another month.

Thus the rainfall collected in the new gauge was measured once a month only, while that in the smaller Symon's gauge was measured daily; and as this comparison was carried on throughout the rains and the subsequent fine and cold season, the new form of gauge has been fairly tested. The results are given in the following table; the rain of both gauges having been carefully measured, and the accuracy of the measuring-glasses verified by weighment of their contents. The small corrections, resulting from the verifications, have been applied to the figures in the table.

* In the drawing sent one was 20 inches the other about 7 inches in height.

Comparative table of the rainfall at Alipore observatory, as measured daily in a 5-inch gauge, and monthly in an 8-inch gauge with evapometer.

Month.	Actual Measurement, Monthly.			Corrected difference—rainfall.	Total of daily measurement.	Error of monthly measurement.
	Evapometer.	Gauge.	Difference.			
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
April	3·08	5·91	2·83	2·88	2·01	+0·87
May	3·37	8·90	5·53	5·63	4·88	+0·75
June	3·68	18·70	15·02	15·31	14 78	+0·53
July	3·58	17·03	13 45	13·71	13·46	+0·25
August	3·74	17·18	13 44	13·70	13·33	+0·37
September	3·63	16·95	13·32	13·57	13·17	+0·40
October	3·70	8·97	5·27	5·37	5·11	+0·26
November	3·62	3·96	0·34	0·35	0 02	+0·33
December	3·61	4·05	0·44	0·45	0·15	+0·30
January	3·64	3·90	0·26	0·26	...	+0·26
Total	...	...	...	71·23	66 91	+4·32

The quantity shown by the new gauge is therefore constantly in excess; and there can be little doubt that this is owing to the evaporation from the evapometer being greater them from the gauge. Nevertheless for a rough measurement of the rainfall, in the rainy season, the instrument may serve fairly enough; and I think that one or two slight alterations may very much improve its working.

It is not difficult to decrease the evaporation in the evapometer by increasing the size of the outer cone, and a few trials will show what dimensions give the best result.

VIII.—*On some Lepidopterous Insects belonging to the Rhopalocerous Genera* Euripus *and* Penthema *from India and Burmah.*—*By* J. Wood-Mason, *Deputy Superintendent, Indian Museum, Calcutta.*

[Received 5th February;—Read 6th April, 1881.]

(With Plates III & IV.)

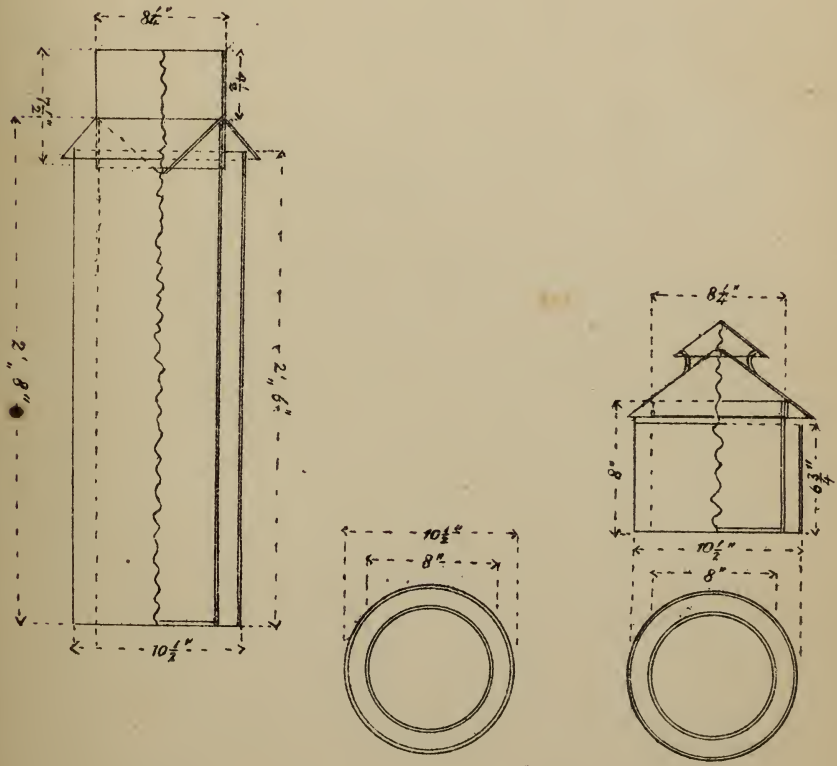
1. Euripus consimilis. Pl. IV, Fig. 3.

Diadema (*Hestina*) *consimilis*, Westwood, Gen. Diurn. Lep., vol. ii, p. 281, note, ♀.

A fine specimen of the female of this striking species taken in the autumn of the past year in the Thoungyeen forests, British Burmah, by

ELEVATION AND SECTION

of a Raingauge-evapometer for remote and secluded Stations.



ZINCOGRAPHED AT THE SURVEYOR GENERAL'S OFFICE, CALCUTTA.